Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

In the Matter of:	)	
	)	
Public Safety and Homeland Security Bureau Makes	)	
Available the Recommendation of the Technical	)	PS Docket No. 12-74
Advisory Board for First Responder Interoperability	)	DA-12-811

Comments of IPWireless, Inc.

IPWireless, Inc. ("IPWireless") hereby submits comments in response to the content of the report announced in this Public Notice.

I. Background

IPWireless is a developer and manufacturer of 3GPP Release 8/9 Long Term Evolution ("LTE"), supplying end-to-end LTE systems, including Radio Access Network (RAN) infrastructure, Evolved Packet Core (EPC) and User Equipment (UE), and is therefore an interested party in this proceeding. Additionally, IPWireless is an active contributor to 3GPP standards.

II. Comments on Recommendations

In the response below, IPW provides overall comments on the general content of the report, as well as commenting on specific requirements set forth by the board.

In general, IPWireless finds the content put forth by the Technical Advisory Board to be technically rigorous and produced through a methodical and sound approach. The Recommended Requirements (or "shall" statements) provide, unless noted below, a set of rules that are consistent with the board's mandate in the Middle Class Tax Relief and Job Creation Act of 2012 (Spectrum Act). However, we note

that more than half the document is dedicated towards providing Recommended Considerations (or "should" statements) and associated explanatory information. These Considerations and associated information fall outside the scope of content to be provided by the Technical Advisory Board. While being acknowledged in the report as "subject matter outside of this derived scope", IPWireless is concerned that this form of combined presentation of recommended Requirements and Considerations clouds the separation of "minimum technical requirements" and issues to be considered by FirstNet in the future in parallel with network architecture, deployment decision, etc, and would prefer to see the report more closely adhere to the board's mandated scope. The board members would of course be free to make their recommendations to FirstNet separately.

Recommended Requirements Comments:

[10] As worded, we interpret the recommended requirement such that UE must have integrated GPS receivers. While IPWireless agrees on the importance of accurate, typically GPS based, user location in most scenarios, we do note that there are certain instances where a requiring integrated GPS is not necessary and potentially conflicts with key characteristics of certain device types. For instance, with fixed Machine-to-Machine ("M2M") devices, knowledge of their location may not require near real-time GPS. As such, adding GPS receiver can conflicts with the goal of achieving low cost and low power in some M2M devices such as remote sensors (for example gunshot sensors).

Regardless of UE capability, IPWireless does concur on the universal need for the network to be capable of transporting GPS data.

[15] IPWireless interprets that this requirement enables a range of devices with varying roaming capabilities. It does not require that all devices support roaming, and furthermore does not require roaming capable devices to support every possible band and technology combination of potential roaming partners.

Additionally, in order to avoid the scenario whereby roaming partners dictate which chipsets and devices can roam onto their network, we recommend the addition of "subject only to PTCRB conformance certification for stated bands" for roaming capable devices.

[22] While IPWireless agrees that System Level Testing as described in section 4.3.5 is an important step in validating the operation of a network, a First Office Application ("FOA") test may be dependent on the architecture and nature of deployment of FirstNet, including opt-in versus opt-out. As such because this requirement presupposes the existence of an FOA process, we believe that requiring a single FOA test is beyond the scope of the Act and therefore should not be included in the Recommended Requirements.

[23] IPWireless fully agrees that backwards compatibility is an important aspect of LTE. However, because this is only an implicit objective of the standards, requiring such backward compatibility falls outside the scope of the board's mandate of basing "recommended minimum technical requirements on the commercial standards for Long Term Evolution (LTE)" and should, if included, only be a Recommended Consideration or "should" statement.

[25] With regards to the stated requirement to "preferentially support X2 handover", IPWireless interprets this to mean that the X2 interface and associated handover procedures are desirable, but not mandatory. While IPWireless will support the X2 interface per the standard, we find that the negligible performance gains combined with increased operational complexities in establishing pair-wise X2 connections between eNodeB does not warrant the need to make the use of the X2 interface mandatory. In support of this, though dependent on the network architecture and location of EPC elements, in many scenarios, we find that the handover performance using X2-based handover procedures has negligible advantage over those using S1-based procedures. Additionally, requiring X2 in all instances may cause operational complexities such as where X2 interfaces bridge between local domains and requires exposing and sharing IP architectures and schemas between these domains. For such a scenario, S1-based methods limit the inter-domain interfaces to single EPC interfaces in line with the recommended consideration (49), and hide the topologies and address spaces of their networks.

Furthermore, in line with the recommended "Standard Implementation Methodology" per Recommended Requirement [1], the X2 interface is currently not commonly used by commercial service providers. As such, explicitly requiring X2 specifically at this stage would appear to contradict the recommended interface implementation methodology, and put public safety in the difficult (and potentially expensive) position of implementing features ahead of the commercial operators.

Finally, though purely informational, for completeness, it should be noted in section 4.5.2.1 that for intra-MME handover, S1-based procedures are still valid. As such, an equivalent description of the S1-based methods should be included.

[35] Based on the referenced section 4.2 of 3GPP TS 22.011, to align with the intent of the standard, Access Class assignment per a predetermined schema should be restricted to the "special categories" (Access Class 11 through 15). As such, IPWireless recommends that the requirement wording be amended to restrict the nationwide schema to the "special categories" identified in the 3GPP specification.

[37] IPWireless agrees with the board on the importance of ensuring end-to-end security via VPN/MVPN. However, in our experience, we find that achieving desirable prioritization of encrypted VPN traffic requires involvement of both LTE equipment and the VPN equipment. In order for LTE to

apply the QoS based on traffic type, it is necessary for the LTE packet filters associated with the Traffic Flow Templates ("TFT") to be able to access identifying information for each traffic type within an encrypted VPN tunnel. Typically, this is achieved via packet tagging using a mechanism such as Differentiated Service Code Point. However, this requires that the VPN is capable of tagging packets in line with the QoS schema set forth by FirstNet. In previous networks deployed for public safety, IPWireless has worked with VPN vendors to ensure that VPN equipment has the capability to perform such packet tagging and then implement the network's QoS based on the DSCP markings. It is our understanding that VPN/MVPN equipment falls outside the scope of NPSBN equipment. As such, IPWireless recommends that the requirement be reworded to bound the responsibility of NPSBN equipment to provide QoS based on proper tagging of encapsulated packets.

III. Conclusion

With the exception of a several requirements noted above, IPWireless finds the minimum technical requirements recommended by the board to be technically sound and appropriate for establishing interoperability across FirstNet. However, to maintain strict adherence to the board's mandate, the report should be limited to these recommended requirements and only information directly associated with those requirements.

Respectfully submitted,

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